DOCUMENT RESUME

ED 410 076 RC 021 089

TITLE	Preliminary Data Analysis of a National Merged Database as Applied to Implementation of the School and Library Discount Matrix in Section 254 of the Telecommunications Act of 1996.
INSTITUTION	Missouri Univ., Columbia. Rural Policy Research Inst.
REPORT NO	P97-5
PUB DATE	15 Apr 97
NOTE	29p.
PUB TYPE	Numerical/Quantitative Data (110) -- Reports - Research (143)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	*Access to Information; Elementary Secondary Education; *Equal Education; *Federal Legislation; Libraries; Lunch Programs; Policy Analysis; Poverty; *Public Policy; Rural Schools; Rural Urban Differences; School District Wealth; *School Districts; Tables (Data); Telecommunications Access to Services; Affordability; Rural Policy Research Institute; *Telecommunications Act 1996; *Telecommunications Policy

ABSTRACT

This document aims to assist understanding of the Telecommunications Act of 1996 and to insure the implementation of a school discount methodology that is rational, equitable, and methodologically defensible. Based on a merged database containing data from 8,814 schools, 5,670,452 students, and 18 telecommunication companies in 7 states, this document addresses four issues. Concerning the first issue, the effect of the proposed discount methodology on schools in various localities, analyses indicate that the failure of the proposed discount matrix to take cost of service into account at free or reduced-price lunch levels above 50 percent unfairly penalizes those districts with high telecommunications rates (usually rural districts). Multiple problems were found with the second issue, whether the use of free/reduced-price lunch percentages at the school building level is an equitable means of determining relative school (or district) wealth, i.e., ability to pay. Its use may be warranted because it has the advantage of year-to-year currency, immediate availability, and appropriateness at the school building level, but three alternative methods for determining discounts are offered. Regarding the third issue, whether the school or the district should be the unit of analysis in determining discount percentages, "school" was found to be preferable, with two exceptions that are discussed. For the fourth issue, which data should be used to determine the cost-of-service factor in the proposed discount matrix, the report recommends that the unseparated loop costs of incumbent local exchange carriers be used as the criteria for determining cost-of-service area. Contains 19 tables and notes on methodology. (TD)

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ED 410 076

PRELIMINARY DATA ANALYSIS OF A NATIONAL MERGED DATABASE AS APPLIED TO IMPLEMENTATION OF THE SCHOOL & LIBRARY DISCOUNT MATRIX IN §254 OF THE TELECOMMUNICATIONS ACT OF 1996

April 15, 1997

AN ANALYSIS

by

THE RUPRI RURAL TELECOMMUNICATIONS TASK FORCE

P97-5

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Abstract

The Rural Policy Research Institute, in an effort to converge basic research information with existing sources of secondary data, continues to bring information to bear on the implementation of the Telecommunications Act of 1996. Four issues are addressed in this document:

1. What is the effect of the proposed discount methodology on schools in various localities?

   a) Does the discount matrix imply a fair distribution of discounts?

   b) Do telecommunications services become "affordable" with the application of discounts as proposed?

   The failure of the proposed discount matrix to take cost of service into account at free/reduced lunch levels above 50% unfairly penalizes those districts with high telecommunications rates.

   The affordability of, or ability to pay for, telecommunications services is clearly enhanced by the proposed discount program for schools and libraries. However, the extent to which poorer schools or libraries located in high cost areas can afford advanced telecommunications services will be dependent on the ultimate price paid, not the level of discount awarded.

2. Is the use of free/reduced lunch percentages at the school building level an equitable means of determining relative school (or district) wealth, i.e., ability to pay?

   Multiple problems exist with the use of percentage of free/reduced lunch participation as a measure of school wealth. No other poverty-related variable, however, has the advantage of year-to-year currency, immediate availability, and appropriateness at the school building level. On these grounds, its use may be warranted, but contingencies and/or alternative methods for determining discounts may need to be devised as follows:

   a) Middle, junior high, and high schools could be allowed the option of using the more preferable of two percentages: (1) the free lunch percentage for their own school; or (2) the prorated average percentage of all district elementary feeder schools.

   b) Schools not participating in the free lunch program could be allowed to use a comparable district-level census statistic, e.g., value of owner-occupied housing or median household income, at least for the initial year of the program or until such time that a free lunch application process could be implemented or direct certification procedures undertaken.

   c) Reduced lunch eligibility could be eliminated as an additional qualifier. The use of free lunch participation or eligibility percentages alone would both simplify the certification process for schools and allow schools using 'direct certification' to qualify for their maximum discount. It would also tend to reduce the dollar demand

on the Universal Service Fund and/or broaden the participation level across a larger number of schools.

3. Should 'school' or 'district' be the unit of analysis in determining discount percentages?

'School' seems to be the preferable unit of analysis in determining discount percentages, except:

a) High schools, junior high schools, and perhaps middle schools could be allowed to use data from feeder elementary schools (as explained above); and

b) Districts making an application for telecommunications discount for the purpose of implementing a district-wide telecommunications project involving all schools may be allowed to compute a prorated average across all elementary schools in lieu of a differential discount for each school involved.

4. What data should be used to determine the 'Cost of Service' factor in the proposed discount matrix?

a) What is the impact of using 'USF Cost per Loop' as the 'cost of service' factor?

b) How should the 'cost of service' factor be divided between High, Mid-, and Low?

The unseparated loop costs of incumbent local exchange carriers can be used as the criteria for determining cost of service area, e.g., "High = >114%", "Mid = 85-114%", and "Low = <85%" of the national average cost per loop as determined by the National Exchange Carriers Association.

Preliminary Data Analysis of a National Merged Database as Applied to Implementation of the School & Library Discount Matrix in §254 of the Telecommunications Act of 1996

A goal of the Rural Policy Research Institute and its Telecommunications Task Force is to inform the implementation of the Telecommunications Act of 1996 through the application of academic and applied research to public policy issues. A wealth of information exists in secondary data sources, but the informed analysis of existing data in conjunction with the timely conduct of basic research can provide an invaluable guide to the pragmatic implementation of such expansive legislation.

To this end RUPRI has published several policy briefs and research reports which are intended to assist citizen understanding of the Telecommunications Act of 1996 and/or facilitate the implementation of the Act by Congress and the FCC:

- "The Telecommunications Act of 1996: The Rural Impacts of Critical FCC Telecommunications Access Decisions", September, 1996
- "The Utility of a Discount Methodology for Implementing Congressional Intent Regarding Section 254 of the Telecommunications Act of 1996: Preliminary Findings and Executive Summary", October 30, 1996 (An analysis jointly sponsored by the Council for Educational Development and Research (CEDaR) and the Rural Policy Research Institute (RUPRI)
- "A Summary of Recommendations of the Federal-State Joint Board on Universal Service: Support for Schools and Libraries", November, 1996 (RUPRI Telecommunications Policy Brief P96-9)
- "Rural Implications of the 1996 Telecommunications Act", November 21, 1996 (A videotape of the RUPRI National Satellite Town Meeting Broadcast)
- "Critical Rural Considerations Regarding Joint Board Recommendations Concerning Section 254 of the Telecommunications Act of 1996"

Ongoing/Future RUPRI Analyses

- Ongoing/future RUPRI analyses related to § 254 include:
- Formation of a panel of two school district administrators from each of the eight states involved in the original CEDaR/RUPRI Research Study. This panel, convened with the assistance of the Regional Education Labs across the country, will converge one large school administrator and one small school administrator from Florida, Maine, West Virginia, Illinois, Missouri, Texas, Nebraska, and Nevada for the purpose of developing a draft School Telecommunication Discount Application. Timeline for completion: May 1, 1997.

- Study of a random sample of local exchange carriers with less than 50,000 access lines in order to determine the baseline information for rural telcos relative to their company's positioning based on anticipated effects of deregulation. Timeline for completion: May 7, 1997.

- Study of the geographic boundaries of one state's library districts in order to determine the differential between using the free lunch statistics associated with the school(s) included in the library districts versus the census data on income and poverty as determined for census tract. Timeline for completion: Pending.

Current RUPRI Analyses

In a continued effort to assist in the implementation of §254 of the Telecom Act and the School/Library Universal Service Fund, RUPRI has created a national merged database (see Methodology Section) of relevant exchange carrier, school, and other information from which the following research report is generated. It is intended to bring direct research data to bear on the imminent decisions of the FCC as it creates the framework by which this historic piece of legislation is implemented.

RUPRI intends to maintain this database, supplemented with the generation of additional basic research pieces and the accumulation of other relevant secondary data sources in order to assist in the ongoing evaluation of the School/Library Discount Program and USF implementation. The discount matrix as proposed by the Joint Board is listed below with the cell numbers referenced for ease of referral.

Free/Reduced Lunch %	Cost of Service		
	Low	Mid	High
<1%	Cell 1	Cell 2	Cell 3
	20%	**20%**	**25%**
1-19%	Cell 4	Cell 5	Cell 6
	40%	**45%**	**50%**
20-34%	Cell 7	Cell 8	Cell 9
	50%	**55%**	**60%**
35-49%	Cell 10	Cell 11	Cell 12
	60%	**65%**	**70%**
50-74%	Cell 13	Cell 14	Cell 15
	80%	**80%**	**80%**
75-100%	Cell 16	Cell 17	Cell 18
	90%	**90%**	**90%**

The primary focus of this current research initiative falls into four areas as detailed below:

1. What is the effect of the proposed discount methodology on schools in various localities?
   a) Does the discount matrix imply a fair distribution of discounts?
   b) Do telecommunications services become "affordable" with the application of discounts as proposed?

- **The failure of the proposed discount matrix to take cost of service into account at free/reduced lunch levels above 50% unfairly penalizes those districts with high telecommunications rates.**

- **The affordability of, or ability to pay for, telecommunications services is clearly enhanced by the proposed discount program for schools and libraries. However, the extent to which poorer schools or libraries located in high cost areas can afford advanced telecommunications services will be dependent on the ultimate price paid, not the level of discount awarded.**

Two related factors impact the 'fairness' of the proposed discount matrix: (1) the matrix fails to take into account the increased price of telecommunications in less densely populated areas for those schools with high free/reduced lunch participation rates; and (2) the 'flatness' of the proposed discounts for schools with higher levels of free/reduced lunch fails to offset the higher prices charged for telecommunications in those areas. As indicated in Table 1, schools in large and mid-size central cities are more likely to have in excess of 50% of their students eligible for free lunch than are schools located in other locales.

Table 1
Percent of Schools in 7-State Study With More Than 50% of Students Eligible for Free Lunch by Locality

	% of Schools with 50-100% of Students Eligible for Free Lunch
Large Central City	52%
Mid-Size Central City	35%
Urban Fringe – Large Central City	24%
Urban Fringe – Mid-Size Central City	19%
MSA	35%
Large Town	18%
Small Town	29%
Rural	23%
Non-MSA	26%

With respect to cost of service, however, the reverse is true. In the 7-State Study, 21% of schools located in large central cities were in the highest cost areas while 56% of schools located in rural areas and 58% of those in suburban mid-size central cities were in the highest cost areas.

Table 2
Percent of Schools in 7-State Study in High, Mid-, and Low Cost Area by Locality

	Cost Area		
	Low	Mid	High
Large Central City	0%	79%	21%
Mid-Size Central City	5%	61%	34%
Urban Fringe – Large Central City	0%	78%	22%
Urban Fringe – Mid-Size Central City	3%	39%	58%
MSA	2%	67%	31%
Large Town	0%	53%	47%
Small Town	0%	65%	35%
Rural	1%	42%	56%
Non-MSA	<1%	53%	46%

Interpretation Notes:

The delineation of "high", "mid-" and "low" cost areas is defined by the number of local exchange carriers whose cost study areas, as defined by the National Exchange Carriers Association, as ">114 ", "85-114%", and "<85%" of the national average cost per loop, respectively.

The flatness of the discount percentage at the 50% or greater free/reduced lunch levels would seem to indicate that:

- Schools located in more densely populated areas are likely to correctly receive higher discounts because they have a greater percentage of reported free/reduced lunch-eligible students;

- Schools located in less densely populated areas are likely to receive lower discounts because of the failure to take the higher cost of service into account.

This would especially place rural schools and those suburban mid-size central city schools, both of whom have the majority of their schools located in high cost areas, at a distinct disadvantage. They would in fact pay more, after discount, for the same service than schools of similar wealth in low-cost areas, raising the issue of both affordability and equity.

Breaking down the schools in the 7-state study area by the discount cell into which they would fall under the proposed scenario, yields the following:

Table 3
Percent of 7-State Study Area Schools by Discount Cell and Locality

	Large Central City	Midsize Central City	Fringe-Lg Cen City	Fringe Midsize CenCity	Large Town	Small Town	Rural	Total
Cell 1 – 20%		**100%**						100%
Cell 2 – 20%	23%	18%	**27%**	6%	5%	16%	5%	100%
Cell 3 – 25%	7%	18%	21%	4%	4%	14%	**32%**	100%
Cell 4 – 40%		**68%**		5%			27%	100%
Cell 5 – 45%	12%	20%	**27%**	8%	3%	15%	16%	100%
Cell 6 – 50%	13%	23%	13%	16%	2%	9%	**24%**	100%
Cell 7 – 50%		**80%**		11%			9%	100%
Cell 8 – 55%	14%	19%	17%	4%	4%	**23%**	19%	100%
Cell 9 – 60%	9%	23%	6%	16%	4%	17%	**27%**	100%
Cell 10 – 60%		**62%**		33%			5%	100%
Cell 11 – 65%	16%	22%	11%	5%	1%	**31%**	14%	100%
Cell 12 – 70%	7%	20%	3%	14%	3%	23%	**32%**	100%
Cell 13 – 80%		**59%**		36%			5%	100%
Cell 14 – 80%	**30%**	29%	11%	2%	<1%	20%	7%	100%
Cell 15 – 80%	5%	20%	8%	9%	3%	20%	**35%**	100%
Cell 16 – 90%		**100%**						100%
Cell 17 – 90%	**46%**	27%	10%	5%	<1%	8%	5%	100%
Cell 18 – 90%	22%	21%	11%	6%	2%	**23%**	14%	100%

Interpretation Notes:

The table may be read as follows: 100% of the schools falling into the Cell 1-20% discount category were located in a mid-size central city. Numbers are not large enough in some cells to be statistically significant.

In the above table, the highest percentage falling within each cell is **bold**, indicating the primary locality in which schools falling within that discount category are located. Note that in Cells 3, 6, 9, 12, and 15--those cells representing the highest cost categories--the highest percentage falls in rural areas. When the discount percentages for small towns and rural areas are combined, schools in those areas account for 55% of the schools in Cell 15 and 37% of those in Cell 18. This represents a substantial percentage of schools whose flat 80-90% discount would be applied to a potentially much greater base cost, than for schools in lower cost areas.

Table 4
Summary of Metropolitan Statistical Area (MSA) Schools in the 7-State Study Area by Proposed Discount Category

Low Cost		Mid-Cost		High Cost	
Cell 1 – 20%	100%	Cell 2 – 20%	74%	Cell 3 – 25%	50%
Cell 4 – 40%	73%	Cell 5 – 45%	67%	Cell 6 – 50%	65%
Cell 7 – 50%	91%	Cell 8 – 55%	54%	Cell 9 – 60%	53%
Cell 10 – 60%	95%	Cell 11 – 65%	55%	Cell 12 – 70%	43%
Cell 13 – 80%	95%	Cell 14 – 80%	72%	Cell 15 – 80%	41%
Cell 16 – 90%	100%	Cell 17 – 90%	87%	Cell 18 – 90%	61%

Interpretation Notes:

The table can be read as follows: 74% of all schools in the Study Area in Cell 2 (20%) were located in an MSA. All cells with the exception of Cell 12 and 15 are predominantly comprised of MSA schools.

Table 5
Summary of Non-MSA Schools in the 7-State Study Area by Proposed Discount Category

Low Cost		Mid-Cost		High Cost	
Cell 1 – 20%	0%	Cell 2 – 20%	26%	Cell 3 – 25%	50%
Cell 4 – 40%	27%	Cell 5 – 45%	33%	Cell 6 – 50%	35%
Cell 7 – 50%	9%	Cell 8 – 55%	46%	Cell 9 – 60%	47%
Cell 10 – 60%	5%	Cell 11 – 65%	45%	Cell 12 – 70%	57%
Cell 13 – 80%	5%	Cell 14 – 80%	28%	Cell 15 – 80%	59%
Cell 16 – 90%	0%	Cell 17 – 90%	13%	Cell 18 – 90%	39%

Interpretation Notes:

The table can be read as follows: 26% of all schools in the Study Area in Cell 2 (20%) were located in a non-MSA. Only Cells 12 and 15 are predominantly non-MSA schools.

Tables 4 and 5 succinctly show the breakdown in study area schools by MSA or non-MSA status, indicating the predominance of MSA schools in nearly all discount categories. Table 6 (below) shows that the number of schools in metro and non-metro areas is roughly equivalent, (although enrollment is 23% higher within metro areas). The differential between the breakdown in number of schools in the 7-state study area and the US as a whole is attributable to two factors: (1) the existence of tariffs (which pre-selected the portions of states selected in the 7-state study) was more prevalent in more highly populated areas; and (2) rural schools are simply more likely to fall

within higher cost categories, as the percentages in Cells 12 and 15 would indicate.

Table 6 below shows the actual enrollment of all U.S. public schools by locality. Of the 87,110 schools, 42,192 or 48.4% are located in non-metropolitan areas--in either large towns, small towns, or rural areas.

Table 6
Percent and Enrollment of all U.S. Public Schools by Locality

	Large Central City	Midsize Central City	Fringe-Lg Cen City	Fringe Midsize CenCity	Large Town	Small Town	Rural	Total
Enrollment /	6,197	8,124	7,453	4,970	1,303	5,679	9682	44082
Percent	14.1%	18.4%	16.9%	11.3%	3.0%	12.9%	22%	100%
Number /	8,677	13,562	12,279	8,321	2,553	12,224	27,415	87,110
Percent of Schools	10.0%	15.6%	14.1%	9.6%	2.9%	14.0%	31.5%	100%
Avg. School Size	724	610	630	615	526	486	314	512

Interpretation Notes:

Enrollment numbers listed are in thousands, e.g., 44,082 = 44,082,000. Reflects 1993 data taken from 1995 Digest of Educational Statistics. Included in the total are 673 students and 2,079 schools whose locality was not known, therefore percentages do not total 100%.

If we apply the percentage of schools from the 7-State Study schools by cost area (taken from Table 2), it is possible to estimate the number of schools across the country who may fall into a high-cost area. As can be seen below in Table 7, it is estimated that roughly 37%, or 32,688 schools may fall into a high cost category. While this number will be verified in later analysis using the national merged database, preliminary estimates affirm that in order to reach an affordable level for telecommunications services, significant attention must be given to the estimated 10%* schools in this country who have greater than 50% of their students eligible for free lunch and who reside in a high cost area.

*NOTE: This estimate is derived from the number of schools in the 7-State Study who have 50% or more of their students qualify for free lunch *and* who fall in a high-cost area. Cell breakdown is as follows: Cell 3 = 9 schools; Cell 6 = 170 schools; Cell 9 = 231 schools; Cell 12 = 237 schools; Cell 15 = 237 schools; Cell 18 = 32 schools. Total = 916 / 8814 = 10%

Table 7
Projected Number of All U.S. Schools in a High Cost Area by Locality

	% of Schools from 7-State Study in High Cost Area	Number of All U.S. Schools By Locality	Projected # of All U.S. Schools In High Cost Area
Large Central City	21%	8,677	1,822
Mid-Size Central City	34%	13,562	4,611
Urban Fringe – Large Central City	22%	12,279	2,701
Urban Fringe – Mid-Size Central City	58%	8,321	4,826
MSA	31%	42,839	13,280
Large Town	47%	2,553	1,200
Small Town	35%	12,224	4,278
Rural	56%	27,415	15,352
Non-MSA	46%	42,192	19,408

Interpretation Notes:

Because the MSA/Non-MSA percentages are not strict arithmetic means, but take the differential number of schools in each locale into account, the subtotals for "Projected Number of All US Schools in High Cost Area" will not equal the total calculated by percentage. Schools whose locales are not known are not included in this table, therefore total of US schools will not equal 87,110.

2. Is the use of free/reduced lunch percentages at the school building level an equitable means of determining relative school (or district) wealth, i.e., ability to pay?

- **Multiple problems exist with the use of percentage of free/reduced lunch participation as a measure of school wealth. No other poverty-related variable, however, has the advantage of year-to-year currency, immediate availability, and appropriateness at the school building level. On these grounds, its use may be warranted, but contingencies and/or alternative methods for determining discounts may need to be devised as follows:**

- **a) Middle, junior high, and high schools could be allowed the option of using the more preferable of two percentages: (1) the free lunch percentage for their own school; or (2) the prorated average percentage of all district elementary feeder schools.**

- **b) Schools not participating in the free lunch program could be allowed to use a comparable district-level census statistic, e.g., value of owner-occupied housing or median household income, at least for the initial year of the program or until such**

time that a free lunch application process could be implemented or direct certification procedures undertaken.

- **c) Reduced lunch eligibility could be eliminated as an additional qualifier. The use of free lunch participation or eligibility percentages alone would both simplify the certification process for schools and allow schools using 'direct certification' to qualify for their maximum discount. It would also tend to reduce the dollar demand on the Universal Service Fund and/or broaden the participation level across a larger number of schools.**

Most of the issues with respect to the problems in using free/reduced lunch percentages have been previously enumerated in other filings. Among those, the major issues are:

- Free and reduced lunch applications reflect student family income eligibility only to the extent that all eligible families complete applications. Typically, only those students/families who apply for free/reduced lunch are those who wish to receive free or reduced lunch services. It is anticipated that in many, if not most, districts the percent of students listed as "eligible" for free/reduced lunch is an underrepresentation of the total who would be eligible if they applied. (This informed hypothesis will be tested with the RUPRI panel of school district administrators across the 8-State Study area.)

- Some states have chosen to allow districts to approve free/reduced lunch status by means of "direct certification", meaning that those students in families who receive AFDC or Food Stamps may automatically qualify by virtue of confirmation of AFDC or Food Stamp eligibility. This, however, is a policy which is not widespread. Most schools still rely on the parent/guardian application process.

- Not all public schools participate in the Free/Reduced Lunch Program. Alternative criteria must be provided for those schools as well as for the private schools and libraries eligible for telecommunications discounts. (This issue will be addressed in a subsequent RUPRI analysis of library districts and the comparison between the average free lunch participation rates of the school(s) located within its boundaries and specific census tract data related to income and poverty.)

- The potential for undercounting free/reduced lunch-eligible students is likely to be greater in many rural areas, thereby negatively impacting the discount rates for which rural schools would be eligible under the proposed matrix. (Subsequent RUPRI analysis will further address this issue.)

- High school student participation in the Free/Reduced Lunch Program is markedly below that of elementary school students, indicating a problem in the fairness of using specific school free/reduced lunch percentages as the determinant of telecommunications discounts.

Viewing the breakdown of percent of schools by locality and free lunch category across the 7-state study area, it can be seen that while more than half of the study schools in large central cities

had more than 50% of their students participating in the Free Lunch Program (or had otherwise directly certified their students), that was true for only 23% of rural schools

Table 8
School Locality by Free Lunch Category
for Schools in the 7-State Study Area

	Free-Lunch Category						
	≤1%	1-19%	20-34%	35-49%	50-74%	75-100%	TOTAL
Large Central City	1%	19%	16%	12%	24%	**28%**	100%
					52%		
Mid-Size Cent City	1%	2%	**23%**	17%	22%	13%	100%
					35%		
Fringe-Large City	2%	**44%**	21%	10%	15%	9%	100%
					24%		
Fringe-Midsize City	1%	**33%**	26%	21%	12%	7%	100%
					19%		
MSA					20%	15%	
					35%		
Large Town	2%	29%	**38%**	14%	14%	4%	100%
					18%		
Small Town	1%	18%	**26%**	**26%**	22%	7%	100%
					29%		
Rural	1%	26%	**28%**	21%	19%	4%	100%
					23%		
Non-MSA					20%	6%	
					26%		

In the U.S. as a whole, the percent below poverty can be seen in the table below:

Table 9
U.S. Percent of Persons Below Poverty by Locality

% Below Poverty	
In metropolitan areas	13.4%
In central cities	20.6%
Outside central cities	9.1%
Outside metropolitan areas	15.6%

In comparing Tables 8 and 9, one would expect to see a higher proportion of schools in central

cities with high levels of free lunch participation. This is borne out by the 52% and 35%, respectively, of schools in large and mid-size central cities with more than 50% of their students qualifying for free lunch. As indicated in Table 9, however, 15.6% of non-metro persons are below poverty as compared to 13.4% of those in metro areas. This relationship does not hold true, however, when looking at Table 8. Only 26% of those schools in non-metro areas, as compared to 35% of those in metro areas, fall into the two highest categories of free-lunch participation. This would lend credibility to the as yet unverified claim that free-lunch participation is undercounted in rural areas.

High school free and reduced lunch eligibility data, as currently collected, is not an accurate representation of school wealth, and will need to be adjusted, as discussed in the following section.

In spite of these drawbacks, however, there exists no other readily available, current data at the level of individual school building which is preferable. Clearly, a combination of census data on "Value of Owner-Occupied Housing" and "Median Household Income" would yield a more accurate assessment of district "ability to pay", but two problems remain: (1) as census data it would not reflect timely changes in community financial circumstances; and (2) it would be district-level, rather than school-level, data, thereby eliminating the ability to differentiate across broadly different financial circumstances from school to school within a district.

An argument for modification of the proposed matrix, however, to include percentage of students qualifying for free lunch as opposed to both free and reduced lunch can be made. The exclusion of reduced lunch eligibility percentages would allow the remote auditing of school applications with the least amount of time, effort, and expense. Percentages included in the applications could be spot checked against the Common Core of Data (CCD) maintained by the National Center for Educational Statistics. The CCD includes free lunch data for nearly all states and schools. Any discrepancies could then be verified with the state education agency (SEA) by phone, fax, e-mail, or computer disk; or, as a last resort, with the individual school. It could also be argued that elimination of reduced-priced lunch eligibility would fairly reduce the demand on the USF by decreasing the percentage discount applicable to all schools. Table 10 below shows the breakdown of schools in each discount category, as currently proposed, *except* that free lunch only was used as the wealth of school variable. (It should be noted that throughout this analysis, only free lunch statistics have been used for purposes of determining discount percentages.)

Table 10
Distribution of Schools in the 7-State Study Area
by Proposed Discount Percentage

	Cost of Service							
	Low Cost		Mid-Cost		High Cost		Total	
Free Lunch %	#	%	#	%	#	%	#	%
<1%	1	~0%	62	.7%	28	.3%	91	1%
1-19%	59	.7%	1529	17%	709	8%	2297	26%
20-34%	44	.5%	1163	13%	871	10%	2078	23%
35-49%	21	.2%	811	9%	745	9%	1577	18%
50-74%	22	.2%	1064	12%	668	8%	1754	20%
75-100%	2	~0%	788	9%	227	3%	1017	12%
TOTAL	149	2%	5417	61%	3248	37%	8814	100%

3. Should 'school' or 'district' be the unit of analysis in determining discount percentages?

➢ **'School' seems to be the preferable unit of analysis in determining discount percentages, except:**

a) High schools, junior high schools, and perhaps middle schools might be allowed to use data from feeder elementary schools (as explained above); and

b) Districts making an application for telecommunications discount for the purpose of implementing a district-wide telecommunications project involving all schools may be allowed to compute a prorated average across all elementary schools.

While §254 repeatedly refers to "school" as the unit of implementation, several factors should be considered which impact the use of 'school' or 'district' as the unit by which discount percentages are calculated:

- Free and reduced lunch data is collected at the school level
- Free and reduced lunch data, where it exists at the district level, is an average of all school data, either prorated according to enrollment or as a crude arithmetic mean.
- High school free and reduced lunch eligibility data, as currently collected, is not an accurate representation of school wealth, and will need to be adjusted, perhaps by

allowing the use of the more favorable of either the school percentage or the district average.

- Where multiple schools within a district are involved in a single request for discounted telecommunications services, district averages may need to be used.

- Expenditures for telecommunications are not typically paid at the school level nor is revenue received at the school level; both reflect district-level issues. This may undermine the logic of using 'school' rather than 'district' as the unit of discount.

High school student participation in the Free/Reduced Lunch Program is significantly below middle and elementary participation levels. On a national level, elementary participation exceeds high school participation by 17%--39% for elementary students and 22% for high school students. For many schools this differential is far greater. In the District of Columbia, for instance, the differential between elementary and high school student participation in the free/reduced lunch program is 49%. In every state for whom Common Core Data records free lunch percentages, elementary participation exceeds middle/junior high, and high school participation. For most, it is a significant difference, of the magnitude of 10-25%. This would indicate a critical need to adopt an alternative procedure for setting the discount rates of high schools in particular and perhaps for middle and junior high schools. An alternative may be the utilization of the more preferable percentage of either: (1) the free lunch participation/eligibility rate for the school itself; or (2) the average prorated free lunch participation/eligibility rate for all elementary feeder schools. An additional alternative which may be considered is the use of the average elementary rate for schools in the district as the 'district average'.

Because revenues and expenditures are typically not generated or paid at the individual school level, districts applying for a telecommunications discount for service in multiple or all schools may best be served by the generation of a single qualifying discount percentage rather than multiple discount percentages. A single district-wide discount percentage would avoid differential payments for identical services across multiple schools in the same district. This is not to say, however, that individual school discounts would not apply where implementation of a technology in a single school is planned.

A broad-based plan to get accurate, succinct, and user-friendly information in the hands of all school administrators is paramount to the successful implementation of this effort. This might best be achieved through multiple means, but with primary emphasis on the dissemination of common information through the cooperative efforts of the state education agencies (SEA's) and the state public utility commissions (PUC's). As a byproduct of a successful information campaign, schools may quickly come to understand the importance of altering their free/reduced lunch application process. Instead of inviting completion of the form by only those who wish to participate in the free/reduced lunch program, they may see the value of moving toward a total population data collection effort and/or use of direct certification procedures.

4.	What data should be used to determine the 'Cost of Service' factor in the proposed discount matrix?

a) What is the impact of using 'USF Cost per Loop' as the 'cost of service' factor?

b) How should the 'cost of service' factor be divided between High, Mid-, and Low?

- **The unseparated loop costs of incumbent local exchange carriers can be used as the criteria for determining cost of service area, e.g., "High = >114%", "Mid = 85-114%", and "Low = <85%" of the national average cost per loop as determined by the National Exchange Carriers Association.**

If the industry-accepted breakdown of unseparated loop costs is used as the geographic cost of service factor in the School/Library Discount matrix, the resultant percentage of access lines falling into each category (and by extension, the approximate proportion of schools*) would be as follows:

Table 11
Number of Access Lines and Exchange Carriers by Cost Area

Cost Area	# / % of Access Lines	# / % of Exchange Carriers
High Cost (>114% of the national average unseparated loop costs	38,077,637 (24%)	846 (59%)
Mid-Cost (85-114%)	69,962,757 (44%)	548 (38%)
Low Cost (<85%)	51,669,529 (32%)	40 (3%)
TOTAL	159,709,923 (100%)	1434 (100%)

*NOTE: The merged database can yield the exact number of schools located within each cost area.

The 3-way delineation of cost areas-- "High = >114%" ; "Mid = 85-114%" ; and "Low = <85%" of the National Average Cost Per Loop-- are widely known and industry-accepted standards. The methodology is in place for calculating such cost area information, which should be helpful with the infusion of new telecommunications carriers into the marketplace.

Other attempts at reaching the Joint-Board suggested proportions for the High, Mid-, and Low Cost categories of 7%, 26%, and 67%, respectively, do not readily correspond to any logical breakdown, nor can those percentages be objectively justified. If, for instance, the High Cost category was equated with the top 7% of access lines in the country in terms of cost, the resulting number of schools falling into that category would be approximately 5880. However, in order to determine which 5880 schools were so identified it would be necessary to rank order all schools in

the country by their incumbent LEC's USF Cost per Loop, then notify those schools falling within each category. This is an unnecessary and convoluted process that can be circumvented with the simple use of the above procedure.

Table 12 shows the percent of schools in the 7-State Study Area by state and discount category, as calculated using free-lunch participation rates as the wealth of school factor and unseparated loop costs as the cost of service factor. While this table should not be taken as an exact predictor of the ultimate percentages for all schools within any one state or as an average for the country, they are illustrative of the differentials which are likely to occur among states and schools within states.

Table 12
Percent of Schools in the 7-State Study Area by State and Discount Category

Free Lunch %		Cost of Service: Low Cost	Mid-Cost	Highest Cost
<1%	**Discount:**	**20%**	**20%**	**25%**
% of FL Sch:		0%	<1%	<1%
% of ME Sch:		0%	0%	0%
% of MO Sch:		0%	1%	<1%
% of NE Sch:		0%	<1%	0%
% of NV Sch:		<1%	0%	0%
% of TX Sch:		0%	1%	<1%
% of WV Sch:		0%	0%	<1%
	All Study Schools	**0%**	**<1%**	**<1%**
1-19%	**Discount:**	**40%**	**45%**	**50%**
% of FL Sch:		0%	2%	22%
% of ME Sch:		0%	0%	25%
% of MO Sch:		0%	37%	2%
% of NE Sch:		0%	52%	0%
% of NV Sch:		21%	27%	0%
% of TX Sch:		0%	18%	5%
% of WV Sch:		0%	0%	13%
	All Study Schools	**<1%**	**17%**	**8%**
20-34%	**Discount:**	**50%**	**55%**	**60%**
% of FL Sch:		0%	2%	25%
% of ME Sch:		0%	0%	50%
% of MO Sch:		0%	22%	2%
% of NE Sch:		0%	46%	0%
% of NV Sch:		16%	11%	<1%
% of TX Sch:		0%	14%	6%
% of WV Sch:		0%	0%	24%
	All Study Schools	**<1%**	**13%**	**10%**

Table 12 (cont.)
Percent of Schools in the 7-State Study Area by State and Discount Category

35-49%	**Discount:**	**60%**	**65%**	**70%**
% of FL Sch:		0%	2%	19%
% of ME Sch:		0%	0%	25%
% of MO Sch:		0%	11%	2%
% of NE Sch:		0%	2%	0%
% of NV Sch:		7%	5%	0%
% of TX Sch:		0%	13%	5%
% of WV Sch:		0%	0%	29%
All Study Schools		**<1%**	**9%**	**9%**
50-74%	**Discount:**	**80%**	**80%**	**80%**
% of FL Sch:		0%	2%	17%
% of ME Sch:		0%	0%	0%
% of MO Sch:		0%	12%	<1%
% of NE Sch:		0%	0%	0%
% of NV Sch:		8%	3%	0%
% of TX Sch:		0%	18%	4%
% of WV Sch:		0%	0%	29%
All Study Schools		**<1%**	**12%**	**8%**
75-100%	**Discount:**	**90%**	**90%**	**90%**
% of FL Sch:		0%	<1%	8%
% of ME Sch:		0%	0%	0%
% of MO Sch:		0%	10%	<1%
% of NE Sch:		0%	0%	0%
% of NV Sch:		<1%	0%	0%
% of TX Sch:		0%	14%	1%
% of WV Sch:		0%	0%	5%
All Study Schools		**0%**	**9%**	**3%**

Interpretation Notes:

This table is based on only those schools included in the service areas of the local exchange carriers for whom tariffs were collected in each of 7 states. The total number of schools represented in each state are as follows: Florida-1548; Maine-4; Missouri-1002; Nebraska-353; Nevada-276; Texas-4947; West Virginia-684. Data for Illinois are not included because the Illinois Department of Education does not maintain free lunch data by school.

The 38,077,637 or 24% of access lines that currently fall into the high cost area are located across the U.S., representing every state and territory with the exception of Connecticut, Delaware, Hawaii, Maryland, Rhode Island, and the District of Columbia.

Table 13
Summary of U.S. Access Lines by Cost Area

	# OF ACCESS LINES	# OF LECs	# OF STATES	# OF SCHOOLS
HIGH = >114%	38,077,637 (24%)	846	45 + 3*	(data pending)
MID = 85-114%	69,962,757 (44%)	548	(data pending)	(data pending)
LOW = <85%	51,669,529 (32%)	40	(data pending)	(data pending)
TOTAL	159,709,923 (100%)	1434	50 + 4*	

Interpretation Notes:

** The data covers 50 states in addition to the District of Columbia and three territories (Virgin Islands, Puerto Rico, and Micronesia)*

Using the criteria for cost of service based on the national average cost per loop of local exchange carrier study areas, it is obvious that the 7-state study does not accurately reflect the national distribution of cost areas. When all LEC study areas are divided into the three cost categories of >114% of the national average, 85-114% of the national average, and <85% of the national average, the 7-state study data show a preponderance of schools in the mid- and high cost categories.

Table 14
Access Lines and % of Schools by Cost of Service Category

	% OF U.S. ACCESS LINES	% OF SCHOOLS IN 7-STATE STUDY
HIGH = >114%	24%	37%
MID = 85-114%	44%	61%
LOW = <85%	32%	2%

This, however, merely indicates the geographic specificity with which cost areas are determined and serves to underscore the diversity of situations that exists from state to state and school to school.

Appendix of Additional Tables and Notes on Methodology

Table 15
Distribution of Schools by Free Lunch Category and Locality

	≤1%	1-19%	20-34%	35-49%	50-74%	75-100%
Large Central City	<1%	3%	3%	2%	4%	5%
Mid-Size Cent City	<1%	6%	5%	4%	5%	3%
Fringe-Large City	<1%	6%	3%	1%	2%	1%
Fringe-Midsize City	<1%	3%	2%	2%	1%	<1%
Large Town	<1%	<1%	<1%	<1%	<1%	<1%
Small Town	<1%	3%	5%	5%	4%	1%
Rural	<1%	5%	5%	4%	4%	<1%

Interpretation Notes:
This table is based on only those schools included in the service areas of the local exchange carriers for whom tariffs were collected in each of 7 states. Total number of schools: 8814

Table 16
Definition of Locality Categories
used in the Common Core Dataset

Large City:	Central city of a Metropolitan Statistical Area (MSA) with a population greater than or equal to 400,000 or population density greater than or equal to 6,000 people per square mile.
Mid-size City:	Central City of an MSA with a population less than 400,000 and a population density less than 6,000 people per square mile.
Urban Fringe of a Large City:	Place within an MSA of a Large Central City and defined as urban by the Census Bureau.
Urban Fringe of Mid-Size City:	Place within an MSA of a Mid-size Central City and defined as urban by the Census Bureau.
Large Town:	Town not within an MSA, with a population greater than or equal to 25,000.
Small Town:	Town not within an MSA and with a population less than 25,000 and greater than or equal to 2,500 people.
Rural:	A place with less than 2,500 people and coded rural by the Census Bureau.

Table 17
Summary of Number of Exchange Carriers by Cost Area in the 8-State Study Area

Missouri:	
44 EC's in Missouri:	34 (77%) were High Cost (>114%)
	10 (23%) were Mid-Cost (85-114%)
	0 were Low-Cost (<85%)
Nebraska:	
42 EC's in Nebraska:	29 (69%) were High Cost
	12 (29%) were Mid-Cost
	1 (2%) was Low-Cost
Nevada	
14 EC's in Nevada:	8 (57%) were High Cost
	3 (21%) were Mid-Cost
	3 (21%) were Low-Cost
Maine	
19 EC's in Maine	11 (58%) were High Cost
	7 (37%) were Mid-Cost
	1 (5%) was Low Cost
Illinois	
56 EC's in Illinois	35 (63%) were High Cost
	16 (29%) were Mid-Cost
	5 (9%) were Low-Cost
Florida	
13 EC's in Florida	11 (85%) were High Cost
	2 (15%) were Mid-Cost
	0 were Low-Cost
Texas	
56 EC's in Florida	48 (86%) were High Cost
	8 (14%) were Mid-Cost
	0 were Low-Cost
West Virginia	
10 EC's in West VA	6 (60%) were High Cost
	4 (40%) were Mid-Cost
	0 were Low-Cost

Interpretation Notes:

Cost of Service:

Low	*<85% of Nat'l Avg*	*= ≤ 211.16*
Mid	*85-114%*	*= 211.17-285.69*
High	*>114%*	*= ≥ 285.70*

Table 18
Comparison of Various Poverty Indicators by States Involved in the 7-State Study

	Free Lunch Participation Rates 1993-94	Rank	Persons Below Poverty 1990	Rank	Mean Family Income 1990	Rank	Median Home Value 1990	Rank	Mean Household Income 1990	Rank
Florida			12.7%	4	$41,860	6	$76,500	5	$36,517	6
Elem	41.8%	3								
Mid/Jr	33.7%									
High	19.2%									
Illinois	NA		11.9%	5	$47,259	8	$80,100	6	$40,885	8
Maine			10.8%	7	$38,374	3	$87,300	7	$33,605	4
Elem	30.5%	4								
Mid/Jr	24.5%									
High	16.5%									
Missouri	NA		13.3%	3	$38,856	4	$59,300	4	$33,441	3
Nebraska			11.1%	6	$32,147	2	$50,000	2	$32,147	2
Elem	20.9%	6								
Mid/Jr	20.1%									
High	20.5%									
Nevada			10.2%	8	$43,672	7	$95,300	8	$38,611	7
Elem	26.9%	5								
Mid/Jr	22.8%									
High	14.7%									
Texas			18.1%	2	$40,255	5	$58,900	3	$35,618	5
Elem	45.6%	2								
Mid/Jr	36.6%									
High	26.8%									
West Virginia			19.7%	1	$31,290	1	$47,600	1	$27,115	1
Elem	47.7%	1								
Mid/Jr	33.5%									
High	27.3%									

Table 19
Discounted Rates/Month for 56k, T1, and DS3
for Schools in the 7-State Study Area

Discounted 56K Rates Per Month

	FL	ME	MO	NE	NV	TX	WV	AVG
<1%	$330	--	$92	$136	$116	$101	$266	$136
1-19%	219	219	75	94	214	67	178	$121
20-34%	161	175	60	77	144	55	142	$ 99
35-49%	105	132	37	60	112	43	107	$ 72
50-74%	75	--	25	--	53	25	71	$ 42
75-100%	47	--	12	--	14	12	36	$ 18

Discounted T1 Rates Per Month

	FL	ME	MO	NE	NV	TX	WV	AVG
<1%	$630	--	$272	$298	$411	$549	--	$518
1-19%	415	210	184	205	308	378	--	$331
20-34%	306	168	157	168	254	300	--	$269
35-49%	202	126	122	130	201	235	--	$215
50-74%	144	--	65	--	105	142	--	$135
75-100%	87	--	31	--	51	73	--	$ 70

Table 19 (cont.)
Discounted DS3 Rates Per Month

	FL	ME	MO	NE	NV	TX	WV	AVG
<1%	$1753	--	$1290	$1346	--	--	--	$166
1-19%	1178	--	967	926	--	--	--	$1085
20-34%	961	--	766	757	--	--	--	$894
35-49%	741	--	516	589	--	--	--	$725
50-74%	486	--	344	--	--	--	--	$482
75-100%	234	--	172	--	--	--	--	$233

Interpretation Notes:

The base tariff rate to which each school's discount was applied was calculated given a common scenario across all schools of : (1) dedicated line lease for Internet, WAN, and/or video connectivity; (2) access charges to Internet provider or any bundled services excluded; and (3) assumption of 15 miles distance from school to telco central office (or hub) or 40 hours service per month. NOTE: Because it is impossible to calculate distance charges except within the constraints of a given school or district consortium, the table does NOT reflect the actual charges that would be made. It therefore can only be used in a crude estimate of total USF requirements. This analysis will be done subsequently.

Notes on Methodology

The basis for the above analysis is the merged database created from five major datasets:

- Information on all exchange carriers in the country, e.g., USF Unseparated Revenue Requirement, Number of USF Loops, Cost Per Loop, etc.;
- A separate exchange carrier database from which all exchange carriers in the country can be linked to individual schools through NPA/NXX files (Area Code and Prefix);
- A national school database which includes free lunch statistics for the majority of the 85,393 public schools in the country, as well as other basic information at a school and/or district level;
- State-level database on free lunch statistics for Illinois - (not included in above database);
- The RUPRI/CEDaR database on tariff rates in the 8-state study area, which was collected for dedicated 56k, T1, and DS3 services for the three largest carriers and three small carriers having filed tariffs (as selected by the PUC informant). The states include: Florida, West Virginia, Nebraska, Maine, Missouri, Nevada, Texas, and Illinois.

NOTE: The majority of the analysis at this point focuses on the 8814 schools and 5,670,452 students in the Local Exchange Carrier Service Area of the 18 telcos for whom tariffs were collected in the 7-state region, (yielding, roughly, a 10% sample). Because the Illinois Department of Education does not collect free lunch data at the school level--they maintain only district-level data--they have been excluded from the bulk of this analysis.

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